

Abstract Submitted
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Photoexcitations Spectroscopy of 2D Hybrid Lead Iodide Perovskites¹ YAXIN ZHAI, University of Utah, CHUAN-XIANG SHENG, Nanjing University of Science and Technology, CHUANG ZHANG, SANGITA BANIYA, SANDIP ARYAL, ZEEV VALY VARDENY, University of Utah — Quantum and dielectric confinement effects in Ruddlesden-Popper 2D hybrid perovskites give rise to unique properties such as large exciton binding energies and anisotropic charge transport. We have studied the ultrafast transient response of photoexcitations in hybrid lead iodide 2D perovskite films, $(\text{C}_6\text{H}_5\text{C}_2\text{H}_2\text{NH}_3)_2\text{PbI}_4$ using broadband pump-probe spectroscopy in the spectral range of 0.25–2.7 eV with 300 fs time resolution. We found a strong mid-IR photoinduced absorption (PA) band that is due to photogenerated excitons that decays within 20 ps. This PA is correlated with a derivative-like spectral feature in the visible spectral range close to the absorption band edge. The steady-state properties of the 2D perovskites films have also been investigated by cw-PA and nonlinear optics spectroscopies.

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